CLAIMS

1. An ablation treatment apparatus, comprising:

an energy source;

a monopolar multiple antenna device including a primary antenna with a lumen and a longitudinal axis, and a secondary antenna positioned in the primary antenna as the primary antenna is introduced through tissue and deployed from the primary antenna in a lateral direction relative to the longitudinal axis at a selected tissue mass, wherein the primary antenna and the secondary antenna are each electromagnetically coupled to the energy source; and

at least one cable coupling one or both of the antennas to the energy source.

2. The apparatus of claim 1 wherein at least a portion of a distal end of the secondary antenna is constructed to be structurally less rigid than the primary antenna, and the primary antenna is constructed to be rigid enough to be introduced through tissue.

3. The apparatus of claim 1, further comprising:

a sensor at least partially positioned on an exterior surface of the primary or secondary antennas; and

a feedback control system coupled to the energy source and the sensor, wherein the feedback control system is responsive to a detected characteristic from the sensor and provides a delivery of ablation energy output from the energy source to one or more of the antennas.

4. The apparatus of claim 1, wherein the primary antenna has an ablation surface with a length that is at least 20% of a length of an ablation surface of the secondary antenna.

5. The apparatus of claim 1, wherein the primary antenna has an ablation surface with a length that is at least one-third of a length of an ablation surface of the secondary antenna.

6. The apparatus of claim 1, wherein the primary antenna has an ablation surface with a length that is at least one-half of a length of an ablation surface of the secondary antenna.

7. The apparatus of claim 1, wherein two secondary electrodes are provided and laterally deployed from the primary antenna, each of the primary and secondary antennas having an ablation surface to create an ablation volume between the ablation surfaces.

8. The apparatus of claim 6, wherein each secondary antenna includes a sensor to measure temperature.

9. The apparatus of claim 1, wherein three secondary electrodes are provided and laterally deployed from the primary antenna, each of the primary and secondary antennas having an ablation surface to create an ablation volume between the ablation surfaces.

10. The apparatus of claim 9, wherein each secondary electrodes includes a sensor to measure temperature.

11. The apparatus of claim 1, further comprising:

an insulation sleeve positioned in a surrounding relationship around at least a portion of an exterior of the primary antenna.

12. The apparatus of claim 11, wherein the insulation sleeve is adjustably moveable along an exterior of the primary antenna.

13. The apparatus of claim 1, further comprising:

an insulation sleeve positioned in a surrounding relationship around at least a portion of an exterior of the secondary antenna.

14. The apparatus of claim 13, wherein the insulation sleeve is adjustably moveable along an exterior of the secondary antenna.

15. The apparatus of claim 1, further including a ground pad electrode.

16. The apparatus of claim 1, wherein the primary and secondary antennas are RF antennas.

17. The apparatus of claim 1, wherein the primary and secondary antennas are microwave antennas.

18. The apparatus of claim 1, wherein the primary antenna is hollow and coupled to an infusion medium source to receive an infusion medium.

19. The apparatus of claim 1, further comprising:

a cooling element coupled to the primary antenna.

20. A method for creating an ablation volume in a selected tissue mass, comprising:

providing a monopolar ablation device with a primary antenna, a secondary antenna with a distal end, and an energy source electromagnetically coupled to both antennas;

providing a ground pad electrode;

inserting the primary antenna into the selected tissue mass with the secondary antenna distal end positioned in the primary antenna lumen;

advancing the secondary antenna distal end out of the primary antenna lumen and into the selected tissue mass in a lateral direction relative to a longitudinal axis of the primary antenna;

delivering electromagnetic energy from one of a primary antenna ablation surface, a secondary antenna ablation surface or both to the selected tissue mass; and

creating an ablation volume in the selected tissue mass.

21. The method of claim 20, wherein two secondary antennas, each having an ablation surface, are advanced from the primary antenna, and an ablation volume is created between the two secondary antennas ablation surfaces and the primary electrode ablation surface.

23. The method of claim 21, wherein the two secondary antennas are advanced out of a distal end of the primary antenna.

24. The method of claim 21, wherein the two secondary antennas are advanced out of separate ports formed in the primary antenna.

25. The method of claim 21, wherein the two secondary antennas are advanced from the primary antenna and define a plane.

26. The method of claim 20, wherein three secondary antennas are advanced from the primary antenna.

27. The method of claim 26, wherein each of the three secondary antennas and the primary antenna has an ablation surface, and an ablation volume is formed between the ablation surfaces of the antennas.

28. The method of claim 20, wherein the primary electrode has an ablation surface that is at least equal to 20% or more of an ablation surface of the secondary antenna.

29. The method of claim 20, wherein the primary electrode has an ablation surface that is at least equal to one-third or more of an ablation surface of the secondary antenna.

30. The method of claim 20, wherein the primary electrode has an ablation surface that is at least equal to one-half or more of an ablation surface of the secondary antenna.